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EXAMINER

RAMIREZ, JOHN FERNANDO

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3737

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7-9, 11, 23, 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheib et al. (US5628321) in view of McCoy (US6134268).

Scheib et al. disclose a medical signal processing method and system, comprising the steps of: receiving time-based information corresponding to a defined time interval of a time-based, medical diagnostic signal (see abstract); performing a transform on the time-based information to obtain a frequency spectrum (abstract, col. 2, lines 12-30) defined by a set of nonzero amplitude values for a corresponding set of frequencies (col. 4, lines 1-25), wherein the nonzero amplitude values include a first nonzero amplitude value at a first frequency value and a second nonzero amplitude value greater than the first nonzero amplitude value at a second frequency, representing the time-based medical signal as a series of piecewise function segments as describe in Fig. 3 and col. 5 lines 1-29. Scheib et al. further disclose operating a

Art Unit: 3737

processor in a signal processing environment for using the transform to provide an output based on the time-based, medical diagnostic signal (see Fig. 2A, col. 5, lines 50-67, col. 4, lines 55-67, col. 5, lines 1-48), the time-based signal includes a component having a period that is longer than the time interval (abstract, col. 3, line 63 - col. 4, line 6), obtaining an input based on a transmitted ultrasound signal (abstract), and using the spectrum to calculate at least one parameter based on the time-based signal (vascular measurements, cardiac cycle and velocity) (see claims 1 and 2 and abstract), In figures 3, 5A and 8 Scheib et al. disclose that the spectrum defines a substantially continuous function across a frequency range wherein the function has nonzero values for a majority of frequencies of the range. Scheib et al. disclose in Figs. 2A-2B and 8 that the time-based signal is an analog signal and the time-based information is digital time-based information, and the step of performing a transform involves accounting for a digitization error associated with a difference between the analog time-based signal and the digital time-based information (col. 4, lines 55-67, col. 5, lines 1-48; col. 9, lines 1-23).

Scheid et al. substantially teach all the limitations of the claimed subject matter except for specifically the step of performing a transform on the time-based signal to obtain a frequency spectrum defined by *a set of irregularly spaced non-zero amplitude values* calculated directly from the transform. However, McCoy teaches the step of performing a transform on the time-based signal to obtain a frequency spectrum defined by *a set of irregularly spaced non-zero amplitude values* calculated directly from the transform (see abstract, col. 5, lines 15-45).

Art Unit: 3737

Based on the above observations, for a person of ordinary skill in the art, modifying the method disclosed by Scheid et al., with the above discussed enhancements as taught by McCoy would have been considered obvious because such modifications would have provided the desired frequency spacing required for efficient spectrum utilization.

Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheib et al. (US 5,628,321) in view of McCoy and in further view of non-patent literature Jean-Yves *“Modem Spectral Analysis Techniques for Blood Flow Velocity and Spectral Measurements with Pulsed Doppler Ultrasound”*.

Scheib et al. in view of McCoy disclose a medical signal processing method and system as discussed above. However, it appears that Scheib et al. does not explicitly disclose that the spectrum includes first, second and third successive nonzero values associated with first, second and third successive frequencies, where a difference between the first and second frequencies is different than a difference between the second and third frequencies, using the spectrum to modify the time-based signal on a frequency dependent basis, and the time-based signal is an ultrasound signal modulated based on interaction with tissue of an organism including a flow channel and the step of operating comprises determining dimension related information for the flow channel.

In the same field of endeavor, Jean-Yves teaches or suggest spectral analysis techniques applied to pulsed Doppler ultrasonic signals for estimation of flow velocity

Art Unit: 3737

and Doppler spectra, including first, second and third successive nonzero values associated with first, second and third successive frequencies, where a difference between the first and second frequencies is different than a difference between the second and third frequencies, using the spectrum to modify the time-based signal on a frequency dependent basis, and the time-based signal is an ultrasound signal modulated based on interaction with tissue of an organism including a flow channel and the step of operating comprises determining dimension related information for the flow channel (see abstract, see section methods, see pages 592-593 and figs. 3-5).

Based on the above observations, for a person of ordinary skill in the art, modifying the method disclose by Scheib et al. in view of McCoy, with the above discussed enhancements would have been considered obvious because such modifications would have a great effect upon image quality and measurement results in order to derive reliable diagnostic criteria.

Allowable Subject Matter

Claims 12-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **JOHN F. RAMIREZ** whose telephone number is (571)272-8685. The examiner can normally be reached on (Mon-Fri) 7:00 - 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3737

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